https://dx.doi.org/10.22161/ijaers.5.7.2 *ISSN: 2349-6495(P) | 2456-1908(O)*

The Effectivity of Interactive E-Book Based on Science Process Skills using Android Application for Excretion System Material on Students Science Process Skills

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Abstract**—** *To identify the effectivity of interactive E-book based on science process skills using Android application for excretion system material on students science process skills, in senior high school. The participants of this research is all of students of class XI Science 2, in SMA Negeri Kalisat, Indonesia. The design applied for this research is One Shoot Case Study, on the three session of the class, with a different sub chapter for each class session. The performance test was used to assess students science process skills. The effectivity of interactive E-book based on science process skills using Android application were analized by performance test result of science process skills of each session. The result have shown an increase of values on each session. Hence, the interactive E-book based on science process skills using Android application for excretion system material effective on student science process skills.*

Keywords**— *Interactive E-book, science process skills, Android, excretion system, senior high school.***

I. INTRODUCTION

The growing digital technology today demonstrates the use of smartphones with the Android operating system among students is increasing so that today's educators or teachers should seek to bring electronic media closer to students as a means of improving students on learning materials (Smith, 2015). Increased knowledge generated from the development of science and technology is directly proportional to the average usage and the number of users of mobile devices (tablets, smart phones, and others). By 2015, 88% of students ages 13-17 have access to smartphones, so schools shift the policy of banning smartphone use so smartphones can be adapted to today's learning (Clayton and Murphy, 2015).This survey showed a change of societies reading habit. Similarly, a new form of reading called the E-book (electronic book) (Çetin *et al*., 2016).

E-book contains content supported by the material, views, sounds, graphics, animations, videos, movies, and simulations that are presented more varied and interactive and tailored to the educational needs of today's global era compared to conventional books. E-books contains information about materials designed to learn on digital templates and enable to display on mobile devices (Landoni and Diaz, 2003). The E-book has become a sophisticated innovation that is expected to experience progress over time and substite textbook for future prospect (Lynch, 2012; Shen, 2017, Lai and Chang, 2011). However, the use of textbooks is still applied in the learning process at school. E-book provides facilities to students to obtain many information sources troughout hyperlink inserted into it so as to contribute to the various needs of teaching and learning process by providing various advances features (Shiratuddin *et al*., 2006). In addition, to increase the level of student interaction with learning content delivered to students (Gong *et al*., 2013; Tsang *et al*., 2013). The use of E-book on mobile devices such as smartphones and tabs, makes it easy for users to access information anywhere and anytime so that learning becomes efficient (Clark *et al*, 2008; Shelburne, 2009).

The research of interactive E-book has been done by Biranvad and Khasseh (2014) about impact of E-book to academic status, similar research conducted by Fyfe (2014) about E-book in high education, Ebied and Rahman (2015) has done research about interactivy of E-book on students achevement, development of E-book by Çetin *et al*., (2016), and integrate E-book into academik learning by Berg and Dawson (2010). Learning using smart phones can not be separated from technological advances, so the use of smart phones in Indonesia is increasing from year to year. The ability of science process skills can be supported by the use of media in learning.

Scientific process skills are used to help students gain a more long term memory understanding of the material so they are expected to be able to solve all kinds of daily life problems, especially in the face of global competition (Abungu *et al*., 2014). Science process skills has contribution to attaining advance knowledge, skills,

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and productive communication with society (Gultepe, 2016). Scientific process skills as one of the most important part of curricula (Padilla, 1990), therefore in Curricula 2013 with 2016 revision at Indonesia focuses on science process skills wich set forth in Core Competencies (KI) 3, and KI- 4. The content that consist of material and science concepts also process consist of essential skills that students need to gain (Inan, 2010). Science process skills are one of the main goal to be gained in science education because these skills used not only by scientist and students, but also by everyone, to be scientifically educated because scientific process is one of procedure that is fundamentally shape by critical and analitical thinking (Türkmen and Kandemir, 2011). However, research on interactive E-book needs to be further developed, particularly interactive E-book based on science process skills using Android application for excretion system material on student process skill in learning.

II. METHODOLOGY

This type of research is research and development (R and D). This research include research and development because developed an E-book. E-book has developed become interactive E-book based on science process skills using Android application for excretion system material for class XI senior high school. This research uses prototyope development which adopted from Sugiyono (2011), include 3 steps, consist of (1) intoduction, (2) design, and (3) development. The subject of this research and development research is students in class XI Science 2 SMA Negeri Kalisat, Indonesia academic year 2017/2018. The reaserch design was used One Shoot Case Study, by using one groups of samples that is class XI Science 2, and the measured their science process skills performance based on result observation. Students science process skills measurement were made three times at three session in each class.

III. RESULTS

The research is aim to know the effectivity interactive E-book needs to be further developed, particularly interactive E-book based on science process skills using Android application for excretion system material on student science process skills. The aspects of science process skill that was measured consist of (1) observing, (2) answer or ask question, (3) predict, (4) communicate, and 5 (conclude). These aspects included in basic science process skill. Measurement of student science process skill is using performance test, those each aspects will be scored by two competencied observers. Then, the score of each aspect is summed and changed in the form of value (formula 1), after that described by category. Scoring of each aspect using Likert scale 1 to 5. The category of each science process skills value can be seen at Table 1. Then, the result of student science skills can be seen in Table 2.

$$V = \frac{\sum totaled\ score}{ideal\ score\ x\ N}\ x\ 100 \quad \text{..... (1)}$$

Table.1: The category of science process skills value

No	Values	Category
1	$20 \leq x < 36$	Very Low
2	$36 \leq x < 52$	Low
3	$52 \leq x < 68$	Medium
4	$68 \leq x < 84$	High
5	$84 \leq x \leq 100$	Very High

Tabel.2: The performance test result of students science process skills after use interactive E-book based on science process skills using Android application for excretion system material

Number of Students	Session	Total Score		Score Average	Science Process Skills Value	Category
		Obs 1	Obs 2			
39	1	661	639	650	66.67	Medium
	2	710	704	707	72.51	High
	3	746	807	776.5	79.64	High
The Average of Science Process Skills Score & Value				**711.17**	**72.94**	**High**

Table 2 is showed the result science process skills of each session. The science process skills value in the session 1 to 3 are follows 66,7, 72,5, and 79,6. The value in session 1 can be categorized students science process skills is “medium”, and then session 2 to 3 is “high” based on Table 1, because of value increases affect to categorization. The average of students science process skills value from session 1 to 3 is 72,9, and its category is “high”.

IV. DISCUSSION

Based on the Table 2, it can be seen that students science process skills values from session 1 to 3 is increased. It mean that interactive E-book based on science process skills using Android application for excretion system material is effective on student science process skills. That happen because the availability of material features, videos, pictures, and “Challenge” feature is the form of bases science process skills in E-book that developed in this research. Games provide energy in teaching, trigger innovative thinking, and make learning concepts easier for students to understand. The game offers a medium for students to explore and introsperse information in a fun way (Fuszard, 2001). Supported by statement from Siahaan (2017), that use of technology will stiumulate students to be more active during the learning process and engage student in beahvior and mental processes. Hence, with the support of technology will give

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students the opportunity to work with science, and obtain knowledge well because they understand the facts and concepts of science

Studying activities that involving students with technoloigies are very entertaining with the rapid of technological development of today, feels enjoy and happy, can support students learning process (Biggs, 2014). In line with the Kalemkuş *et al.*, (2016), if science and technology has an important role in training individuals who have science process skills observing, collecting data, answer question, critical thinking, communicate, identify problems, troubleshoot, predicting, conclude, and well searching information skills.

V. CONCLUSION AND SUGGESTIONS

Based on the result and discussion, there is an increase in the value of students science process skills while using interactive E-book based on science process skills using an Android application in excretion system material in the learning process. So it can be inferred that the interactive E-book based on science process skills using Android application in excretion system material is effective to students science process skills.

Use of the interactive E-book based on science process skills using Android application in excretion system material can be done if there is internet connection. Hence, suggestions that can be given for further research are 1) interactive E-book based on science process skills using Android application in excretion system material can be used without internet connection, so could economically saving; 2) interactive E-book based on science process skills using Android application in excretion system material can be installed on other operation system in smartphone, example iOS; and 3) interactive E-book based on science process skills using Android application in excretion system material can be supplemented with other Biology material.

VI. ACKNOWLEDGEMENTS

The author would like to thank the Magister of Science Education, Department of Faculty of Teacher Training and Education (FKIP) of Jember University which had supported authors in writing this article.

REFERENCES

[1] Berg, S.A., Hoffmann, K., and Dawson, D. (2010). Not on The Same Page: Undergraduates' Information Retrieval in Electronic and Print Books. The Journal of Academic Librarianship. 36 (6), 518-525.

[2] Biggs, J. (2014). Teaching for Quality Learning at University. Berkshire: Open University Press.

[3] Biranvad, A., and Khasseh, A. A. (2014). E-book Reading and its Impact on Academic Status of Students at Payame Noor University, Iran. Library Philosophy and Practice (e-journal). 1170.

[4] Çetin, G., Özkaraca, O., Güvenç, E., and Sakal, M. (2016). The Development Of An E-book With Dynamic Content For The Introduction Of Algorithms and Programming. Mugla Journal of Science and Technology. 2 (02). 199-203.

[5] Clark, D., Goodwin, S., Samuelson, T., and Coker, C. (2008). A Qualitative Assessment of the Kindle E-book Application: Results from Initial Focus Groups. Performance Measurement and Metrics. 9 (02), 118-129.

[6] Clayton, K., and Murphy, A. (2016). Smartphone Apps in Education: Students Create Videos to Teach Smartphone Use as Tool for Learning. Journal of Media Literacy Education. 8 (02). 99-109.

[7] Ebid, M. M A., and Rahman, S. A. A. 2015. The Effect of Interactive E-book on Students' Achievement at Najran University in Computer in Education Course. Journal of Education and Practice. 6 (19).

[8] Fuszard, B. (2001). Fuszard's Innovative Teaching Strategies in Nursing. 3rd Ed. Gaithersburg: Aspen Publisher.

[9] Fyve, C. (2014). E-books in Higher Education: A Strategic Priority?. London: Ubiquity Press; 1-7.

[10] Gong, C., Chen, G., Wang, X., and Huang, R. (2013). The Functions of E-Textbooks for Utilizing In K-12 Classes: Proceedings of the 2013 IEEE 13th International Conference on Advanced Learning Technologies. 479-480.

[11] Gultepe, N. (2016). High School Science Teachers' Views on Science Process Skills. International Journal of Environmental & Science Education. 11 (05), 779-800.

[12] Inan, H.Z. (2010). Examining Pre-School Education Teacher Candidates' Content Knowledge and Pedagogical Content Knowledge Related Science Process Skills. Educational Sciences: Theory and Practice. 10 (04), 2275-2323.

[13] Kalemkuş, J., Bayraktar, Ş., and Kalemkuş, F. 2016. Determining and Comparing The Science Process Skill Levels of 5th and 8th Grade Students. The Eurasia Proceedings of Educational & Social Sciences (EPESS). 4, 79-83.

[14] Lai, J. Y., and Chang, C. Y. (2011). User Attitudes toward Dedicated E-book Readers for Reading: The Effects of Convenience, Compatibility and Media Richness. Journal of Online Information Review. 35 (04), 558-580.

[15] Landoni, M., and Diaz, P. 2003. E-education: Design and Evaluating for Teaching and Learning. Journal of Digital Information. 3 (04).

https://dx.doi.org/10.22161/ijaers.5.7.2 *ISSN: 2349-6495(P) | 2456-1908(O)*

[16] Lynch, K. (2012). E-books: The Future for Publishers and Libraries. Journal of Collection Building. 31 (02), 78-80.
[17] Padilla, M. J. (1990). The Science Process Skills. Research Matters – To the Science Teacher (No. 9004). National Association for Research in Science Teaching. Retrieved from http://www.narst.org/publications/research/skill.cfm (Accessed May 25, 2018).
[18] Shelburne, W. A. (2009). E-book Usage in An Academic Library: User Attitudes and Behaviors. Library Collections, Acquisitions, & Technical Services. 33 (2/3), 59-72.
[19] Shen, J. (2011). The E-book Lifestyle: An Academic Library Perspective. The Reference Librarian. 52 (1/2), 181- 189.
[20] Shiratuddin, N., Landoni, M., Gibb, F., and Hassan, S. (2006). E-book Technology and its Potential Applications in Distance Education. Journal of Digital Information. 3 (4), 14-23.
[21] Siahaan, P. (2017). Improving Students' Science Process Skills through Simple Computer Simulations on Linear Motion Conceptions. Journal of Physic. Series 812.
[22] Smith, F.D. (2015). Developing Young Scientists: Building Process Skills, Questioning Skills & the Representation of Scientists through Television Viewing and Listening (Sid the Science Kid TV Show). Education Practice And Innovation, 2(02), v1-10.
[23] Sugiyono. (2011). Metode Penelitian Kuantitatif, Kualitatif, dan R & D. Bandung: Alfabeta.
[24] Tsang, E., Yuen, K., Li, K., and Cheung S. (2013). Designing Open Textbooks for Effective Teaching and Learning. Heidelberg, Germany: Springer.
[25] Türkmen, H., and Kandemir, M. (2011). A Case Study on Perceptions of Learning Science Process Skills of Teachers. Journal of European Education. 1 (01), 15-24.